

Patent
42478-3817

REMARKS

Claims 23-32 remain in the application. Claims 33-36 are newly added. Applicant respectfully requests reconsideration.

The Office Action indicates that the application lacked a necessary reference to the prior parent application (Office Action, second Paragraph). However, this reference was added by the entering of the Rule 116 Amendment along with the Preliminary Amendment upon filing the RCE request.

Applicant's invention provides an improved system and method for monitoring and updating the configuration of numerical control (NC) machines. Applicant's invention is especially useful in the production of printed circuit boards (PCBs). To produce a circuit board, a production plan is provided and NC data is generated that details the specifics about each component to be placed on the PCB, the exact location of each of the components, and the dimensions of the PCB. One or more mounting apparatuses located on an assembly line are downloaded with the NC data to enable the fetching of cartridges preloaded with PCB components that are to be mounted on the PCB. The mounting apparatuses can maneuver rotary arms holding the cartridges to precise locations relative to the PCB and attach components from the cartridges. The mounting apparatuses use the NC data to populate the PCB. The NC data also contain information for NC machines that can add circuit print and a conformal coating. It is critical that the NC data for each of the NC machines be complete and accurate.

PCB manufacturers work in a very competitive business environment with multiple suppliers and customers. The PCB production line must respond to changes in production schedules and design changes. Machine failures and component reliability problems frequently require production line changes. The latest changes in parts and design frequently are not

CHARENRYV473839.2

Patent
42478-3817

reflected in the supply and design databases. This results in production line errors and costly time delays.

Applicant's invention addresses this problem by generating NC data in a scheduling apparatus. The scheduled NC data is compared with NC data currently being used by the NC machines with the differences presented to an operator. The operator checks the differences and if the changes are acceptable, the operator accepts the changes with the results being fed back to a Computer Aided Design (CAD) database for use by design engineers.

One advantage of this feedback is that it allows frequent configuration changes and allows the best NC data to be selected at the assembly line. The NC operator can also fine tune the NC design data based on slight changes in the production line. Changes made at the assembly line are immediately reflected in the CAD database allowing engineers to adjust and optimize their designs.

Claims 23-27 were rejected under U.S.C. §112, first paragraph. Applicant respectfully traverses.

The Office Action asserts that the specification fails to provide enablement for obtaining differences between stored NC data that has been most recently stored prior to the generated NC data and generated NC data from the production schedule (Office Action, Section 3, Second Paragraph). The Office Action further asserts that the specification fails to provide enablement for the words "most recently" (Office Action, Section 3, Fourth Paragraph). The claims have been amended to remove the words "most recently stored." Support for the remainder of the recitation is explicitly taught in the specification (Application, Page 30, Paragraph 4).

The above NC data management apparatus or method may compare NC data generated from design information by a CAM system with inspected NC data that has been adjusted so that each piece of equipment can produce a

CHARGEUR V47353.3

Patent
42478-3817

conforming item, and send data showing results of the comparison to a CAM master, as feedback.

Claims 23-32 were rejected under 35 U.S.C. §112, second paragraph. Applicant respectfully requests reconsideration in light of the amendments to the claims.

The Office Action asserts the terms "most recently," "means for storing" and "including production parameters for each mounting apparatus" recited in claim 28 are indefinite (Office Action, Section 4, Second, Third, and Fourth Paragraphs). Claim 28 has been amended to remove these phrases.

The Office Action also asserts that multiple recitations of the phrase "production parameters" renders Claim 28 indefinite (Office Action, Section 4, Fifth Paragraph). Claim 28 has been amended to remove the multiple recitations of the phrase "production parameters."

The Office Action points out that "the difference obtaining means" recited in Claim 26 lacks antecedent basis (Office Action, Section 4, Fifth Paragraph). Claim 26 has been amended to replace the "difference obtaining means" with the previously introduced "NC management apparatus."

For the reasons stated above, Applicant respectfully requests that these rejections be withdrawn.

Claims 23, 24, 28 and 29 were rejected under 35 U.S.C. §103(a) as being unpatentable over *Nakamura* (U.S. Patent No. 5, 757, 648).

It should be noted that the burden of establishing a *prima facie* case of obviousness lies with the Patent Office. *In re Fine*, 5 U.S.P.Q. 2d 1956 (Fed. Cir. 1988) (stating: "The PTO has the burden under section 103 to establish a *prima facie* case of obviousness"). To establish a *prima facie* case of obviousness, (1) there must be some suggestion or motivation (either in the

Patent
42478-3817

references themselves or in the knowledge generally available to one of ordinary skill in the art) to combine the reference teachings; (2) there must be a reasonable expectation of success; and (3) the prior art reference must teach or suggest all the claim limitations. See *MPEP* §§2142-43.

There are a number of evaluations required under Section 103. One highly relevant inquiry is "[t]he relationship between the problem which the inventor. . . was attempting to solve and the problem to which any prior art reference is directed." *Stanley Works v. McKinney Mfg. Co.*, 216 U.S.P.Q. 298, 304 (Del. D.C. 1981). Thus, in analyzing the prior art under Section 103 of the Act, we must clearly comprehend the problem addressed by the present inventors and that problems must be compared or contrasted, as the case may be, with the problems addressed by the prior art.

Nakamura's device purports to convert a machining program for a first device into a machining program for a second (substitute) device, *Nakamura* (Figure 9, Column 7, Lines 5, 10). In *Nakamura's* device, a scheduling assigning section 26 assigns a machine schedule 22 (*Nakamura*, Figure 9). A machine program converting section 32 reads the schedule 22 and determines if there are any substitute machines. If there is a substitute machine, the machine program converting section 32 converts the machining program 34 from code compatible with the first device into code compatible with the substitute device and delivers the code to the machine program transfer section 42. The machining program transfer section 42 in turn transfers the program to the substitute device.

Claim 23 recites "the NC management apparatus generates, for each mounting apparatus, NC data including production parameters for each mounting apparatus that is required to perform production according to the production schedule, and obtains, for each mounting apparatus, differences between stored NC data that had been stored prior to the generated NC data and

Patent
42478-3817

generated NC data from the production schedule, and outputs the obtained differences." The NC management apparatus compares the NC data being used by each mounting apparatus with the newly generated NC data and outputs the difference. This feature is not disclosed or suggested in *Nakamura*.

The Office Action alleges this feature is disclosed in *Nakamura* (Office Action, Section 7, Fifth Paragraph). The cited text, figure and claim language all refer to a converting system (method) that converts a first machining program into a second machining program. However the cited text does not discuss a comparison of NC data, a mounting device, or outputting the difference (Figure 9, Col 7 Lines 33-64, Col 14, lines 27-40, Col 13, Lines 51-62).

The Office Action further asserts, without citing a reference that there are production systems that compare the program of a machine needing to be substituted with the program of the substitute machine (Office Action, Section 7, Seventh Paragraph). Even if it were possible to combine such a production machine with *Nakamura* device it still does not disclose the limitations in the recited invention. Applicant's invention outputs the difference between NC data being used by each mounting apparatus and newly generated NC data for each mounting apparatus.

The combination suggested by the Office Action does not produce a working device. The production machine suggested compares two existing programs. The *Nakamura* device converts a first program into a second (substitute) program (*Nakamura*, Figure 9). As disclosed, it is not possible to compare the first program with the second (substitute) program since the first program has been transformed into the second program (*Nakamura*, Figure 9).

The recited feature is important because it allows an operator compare the differences between the current configuration and the proposed configuration. Specifically, it allows an

Patent
42478-3817

operator at the assembly line to compare the proposed NC data with the current NC data and execute or cancel the change with the results of any change being fed back to the CAD database.

For the reasons stated above Applicant submits Claim 23 is patentable over *Nakamura*.

Claim 28 recites "a difference obtaining step for obtaining, in terms of each production parameter, differences between the acquired NC data and NC data that was used by the parts supply unit for supply of parts. *Nakamura* does not disclose or suggest the use of NC data that was used by the parts supply unit for the supply of parts.

Applicant's invention allows an operator to compare the configuration of the production line (the NC data used by the parts unit) and the proposed configuration of the production line (the acquired NC data). This allows an operator to make the appropriate configuration changes. *Nakamura's* device does not suggest or disclose this comparison. *Nakamura's* device simply converts a first program into a second (substitute) program if the first program is not executable on the substitute device.

For these reasons stated above Applicant submit Claim 28 is patentable over *Nakamura*.

Claim 29 depends from Claim 28 and is patentable for the same reasons.

Applicant respectfully requests that this rejection be withdrawn.

Claims 23-32 were rejected under 35 U.S.C. §103(a) as being unpatentable over *Nakamura* in view of *Kobayashi et al.* (U.S. Patent No. 5,822,210).

Kobayashi discloses a system that allows an automated set-up of NC data by using data stored in an electronic database. The NC data can be used in a production line with mounting equipment with each piece of mounting equipment having a parts supply unit.

Patent
42478-3817

Kobayashi does not disclose any of the missing limitations of *Nakamura* for Claims 23, 24, 28, and 29 as explained above, making Claims 23, 24, 28, and 29 patentable over any combination of *Nakamura* and *Kobayashi*.

Claims 25-27 and Claims 30-32 depend from Claims 23 and 29 are patentable for the same reasons.

For the reasons stated above Applicant respectfully requests that this rejection be withdrawn.

Claims 33-40 are newly added to provide an alternative definition of the invention. Claim 33 discloses a method that includes, preparing a production plan (Application, Figure 2, Page 11 Line 8-Page 13 Line 13), generating NC data (Application, Figure 13, 14, 16, Page 25 Lines 1-2), incorporating data from a parts library (Application, Figure 16, 17, Page 25 Lines 4-12), comparing the data in the parts library (Application, Figure 16, 18, Page 25 Lines 13-17), receiving feedback (Application, Figure 16, 19, Page 25 Lines 18-23) and updating the parts library (Application, Figure 20).

Claims 34-40 also recite a CAD system (Figure 20, lower left blocks), a presentation to an operator (Application, Figure 6), and an NC data editing function (Application, Page 15 Line 20 — Page 18 Line 5).

These features are not taught in the cited references and are believed to be allowable.


Patent
42478-3817

It is believed the case is now in condition for allowance, an early notification of the same is requested. If there are any questions, the undersigned attorney can be reached at the listed phone number.

I hereby certify that this correspondence is being transmitted via facsimile to the USPTO at 571-273-8300 on May 9, 2006.

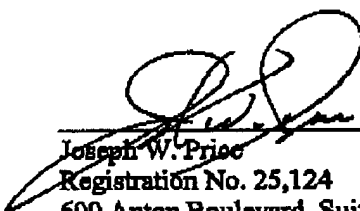
Very truly yours,

SNELL & WILMER L.L.P.

By: Sharon Farnus


Signature

Dated: May 9, 2006



Joseph W. Price
Registration No. 25,124
600 Anton Boulevard, Suite 1400
Costa Mesa, California 92626-7689
Telephone: (714) 427-7420
Facsimile: (714) 427-7799

**This Page is Inserted by IFW Indexing and Scanning
Operations and is not part of the Official Record**

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images include but are not limited to the items checked:

- ☐ **BLACK BORDERS**
- ☐ **IMAGE CUT OFF AT TOP, BOTTOM OR SIDES**
- ☐ **FADED TEXT OR DRAWING**
- ☐ **BLURRED OR ILLEGIBLE TEXT OR DRAWING**
- ☐ **SKEWED/SLANTED IMAGES**
- ☐ **COLOR OR BLACK AND WHITE PHOTOGRAPHS**
- ☐ **GRAY SCALE DOCUMENTS**
- ☒ **LINES OR MARKS ON ORIGINAL DOCUMENT**
- ☐ **REFERENCE(S) OR EXHIBIT(S) SUBMITTED ARE POOR QUALITY**
- ☐ **OTHER:** _____

IMAGES ARE BEST AVAILABLE COPY.

As rescanning these documents will not correct the image problems checked, please do not report these problems to the IFW Image Problem Mailbox.